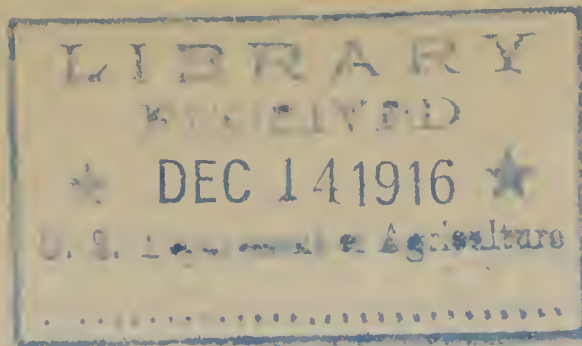


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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS.

U. S. DEPARTMENT OF AGRICULTURE
AND STATE AGRICULTURAL COLLEGES
COOPERATING.

STATES RELATIONS SERVICE, OFFICE OF
EXTENSION WORK, NORTH AND WEST
WASHINGTON, D. C.

STATUS AND RESULTS OF COUNTY AGRICULTURAL AGENT WORK IN THE NORTHERN AND WESTERN STATES, 1915.

By W. A. LLOYD, *Agriculturist in Charge of County Agent Work in the Northern and Western States.*

INTRODUCTION.

The plan of placing field agents in counties to conduct demonstrations pertaining to practical agriculture was introduced into the Northern and Western States in 1911. The plan had already been in successful operation in the Southern States for several years. These men were at first styled county agricultural agents, county advisers, county representatives, etc., but have come to be commonly referred to by the shorter title "county agent."

The county agent work has now been adopted by all the States and is being steadily extended in each State. The map (fig. 1) shows the counties in which such work is now in progress as well as its growth from year to year.

During the fiscal year July 1, 1911, to June 30, 1912, but five county agents were appointed. The increase in the number of county agents since the inauguration of the work has been as follows: Appointed during the fiscal year 1912-13, 113; 1913-14, 90; 1914-15, 140; 1915-16, 113; total number at work June 30, 1916, 419.

PLACE OF THE COUNTY AGENT IN GENERAL PLAN OF EXTENSION WORK.

From the beginning the work in the Northern and Western States has been conducted by cooperation between the State agricultural colleges and the United States Department of Agriculture. The character of the work carried on by the county agents is as varied as the agriculture of the States covered. The agents conduct demonstrations to show the possible restoration to profitable production of depleted soils; to enable the farmer to maintain and increase soil

fertility; to introduce new crops when advisable to do so and to bring about better methods in their cultivation; and to develop and improve the live-stock industry through the introduction of pure-

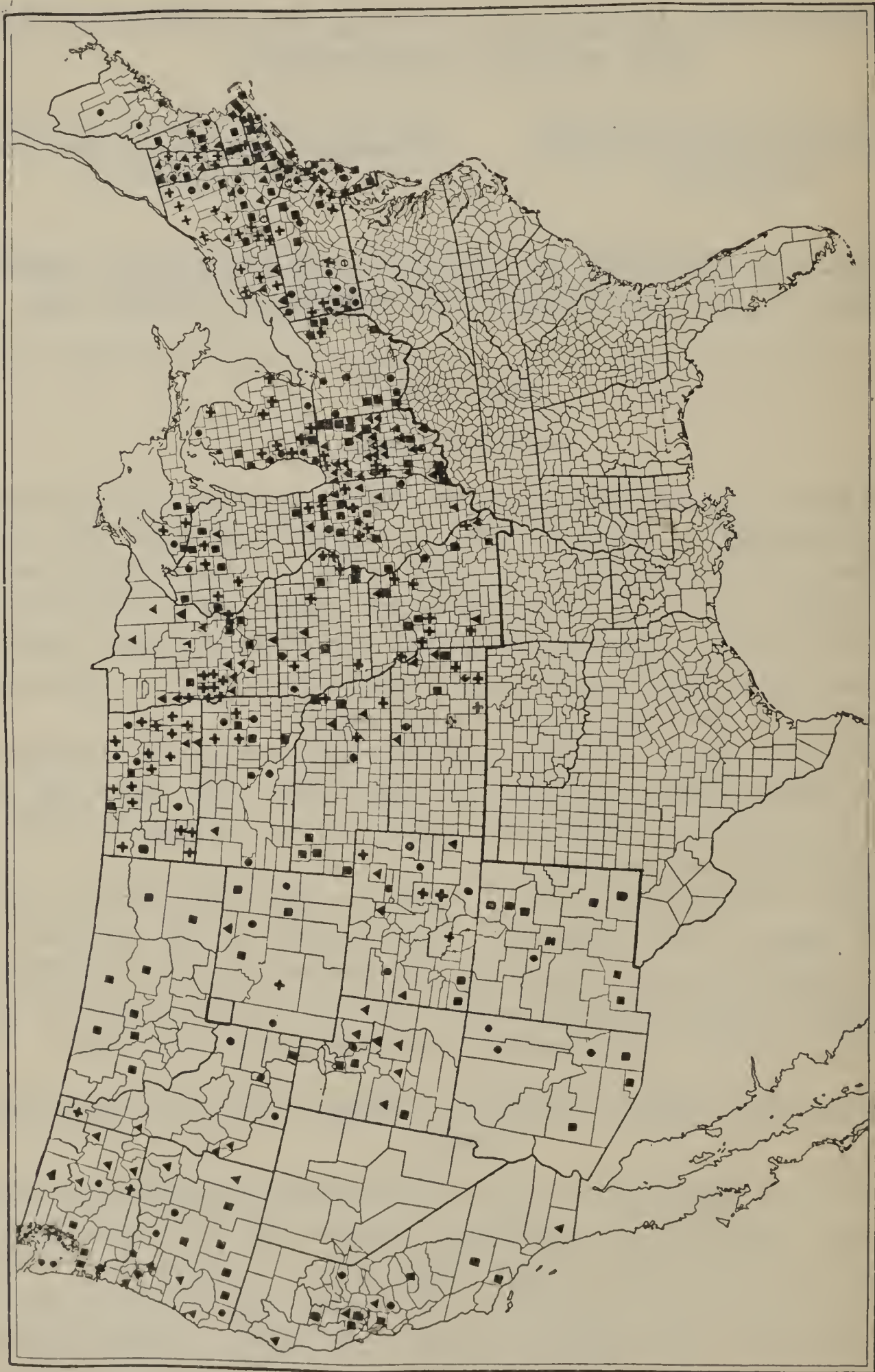


FIG. 1.—Map of the United States showing location of county agents in the Northern and Western States. Circle-bar, agents appointed in 1911-12; cross, 1912-13; triangle, 1913-14; square, 1914-15; circle, 1915-16.

bred sires, the standardization of breeds, the organization of cow-testing associations, breeders' associations, and associations to guard against and control animal diseases. They stimulate cooperation

among farmers in their farm work and in their business relations. The horizon of the county agent includes not only the farm but the home and the family as well. Water supply, sewage disposal, heating, ventilating, and lighting farm houses; sanitation; fly control; and household conveniences have all been important phases of the work. The agents also work with the young people of the country through clubs and otherwise not only to instruct them in elementary agriculture and develop proper pride in doing good work but also to bring about a better appreciation of the country and its advantages.

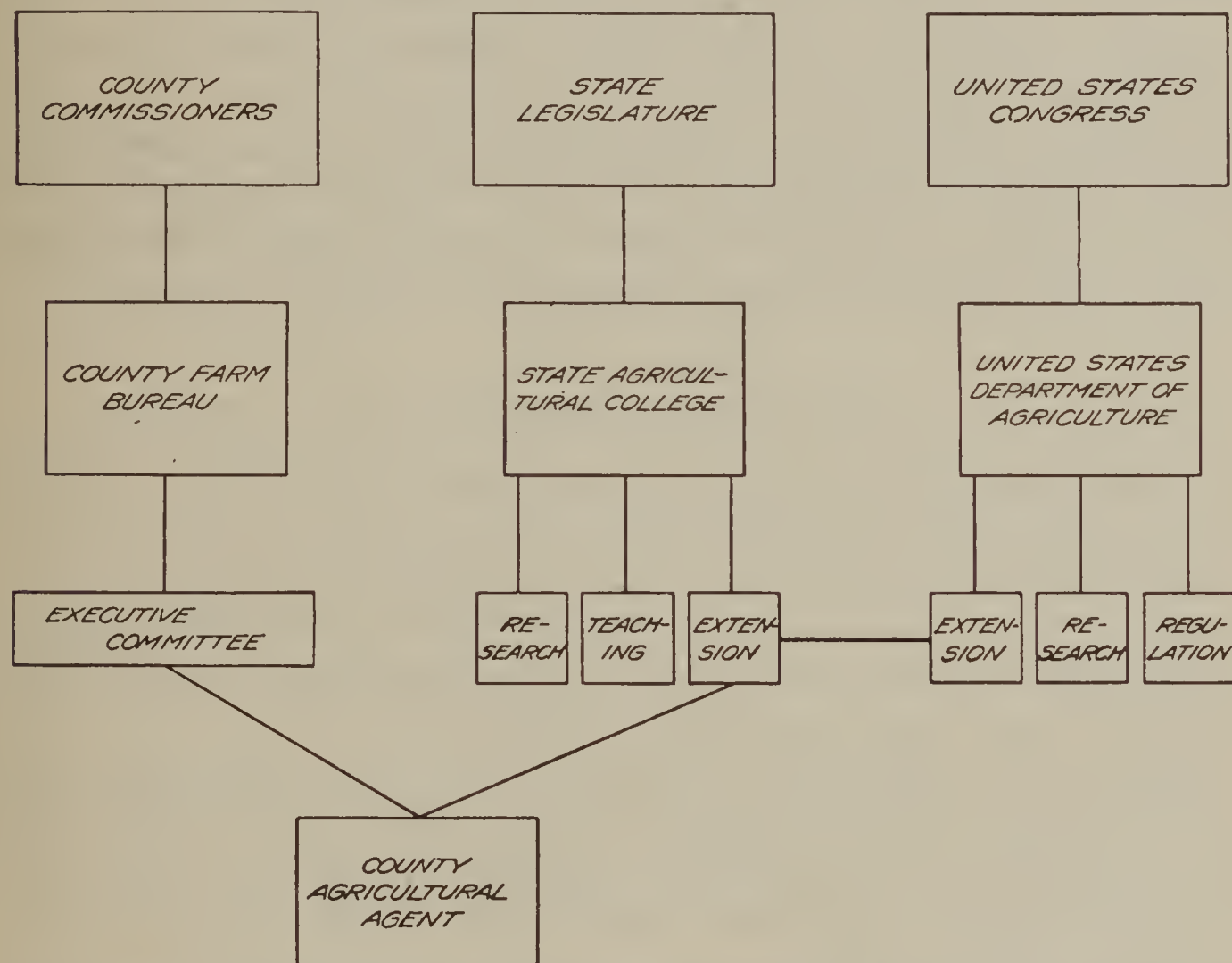


FIG. 2.—Diagram showing the relation the agent sustains to county farm bureaus, State agricultural colleges, and the U. S. Department of Agriculture in extension work.

The county agent has come to have a definite place in the agricultural extension machinery of the county, State, and Nation. His relation to certain public and semipublic institutions is illustrated in the diagram shown in figure 2.

The county agricultural agent is the joint representative of the county farm bureau, the State college of agriculture, and the United States Department of Agriculture in the execution of their plans for a more highly developed, more profitable, and more satisfactory agriculture and home life.

The county commissioners or board of supervisors, the State legislature, and the United States Congress are the sources from which funds are derived for carrying on the work and prescribing

the general conditions under which it is conducted. The county farm bureau, the agricultural college, and the United States Department of Agriculture are the cooperating agencies promoting and directing the work. The college of agriculture and the United States Department of Agriculture unite their forces through their extension offices and employ a State county-agent leader who has charge of the details of supervision. The executive committee of the farm bureau cooperates with the county agricultural agent and county agent leader in the determination of a program of work, the organization of projects, the location of demonstrations, follow-up work, etc. The county agricultural agent is thus the agency through which the agricultural institutions of county, State, and Government reach the people. He is also the people's agent in the more complete and efficient use of these public institutions relating to agriculture and the home and the recognized leader within the county for the promotion and realization of the highest ideals of rural betterment.

LEGISLATION.

National legislation affecting the work is contained in a clause of the act appropriating money for the United States Department of Agriculture which provides for the support of extension work and in the Smith-Lever Act of May 8, 1914, which provides for the carrying on of extension work in agriculture and home economics by cooperation between the United States Department of Agriculture and the various State agricultural colleges.

Many of the States have by legislative enactment provided funds either through general or specific appropriations and in some cases have established the conditions under which counties may secure the service of an agricultural agent. These laws, while differing in details, usually provide—

(1) State appropriations made directly to agricultural colleges, the conditions under which the money becomes available to the counties being usually left to the institution to determine, though sometimes it is fixed by the law.

(2) Provision whereby county or township authorities may make grants or impose taxes for the support of county-agent work.

Some of the laws have limiting conditions, such as, that a certain number of signatures must be secured to petitions asking for the employment of an agent; that the petitioners pledge a certain amount of money; that an organization of a certain number of farmers be formed with a fixed membership fee and that the members shall pledge their support to the work for a definite period.

The following are characteristic features of a few State laws:

The North Dakota law, which is one of the earliest, is also one of the simplest. It gives to the county commissioners authority to levy

a tax not to exceed one-half mill of assessed valuation for the purpose of "promoting diversified farming and agricultural development through the employment of a person or persons to carry on scientific agriculture within said county."

The Indiana law provides that the county council shall upon petition of 20 farmers, accompanied by \$500 to be used in defraying the expenses of the county agent, appropriate \$1,500 toward his salary and expenses. Upon compliance with the above conditions the State agricultural college contributes not to exceed \$1,000 toward the salary and expenses of the agent.

In Iowa county grants for a county agent can only be made upon a majority vote of the people of the county at a regular election.

The Kansas law, which contains many good features, provides for a county appropriation of from \$800 to \$1,600 per annum, conditioned upon the organization of an association of at least 250 members or 25 per cent of the bona fide farmers of the county, who shall pledge a contribution of \$800.

HOW THE WORK IS FINANCED.

The money for the salary and expenses of the county agent is derived from Federal, State, and local sources, as follows:

(1) Money appropriated by Congress to the United States Department of Agriculture for this purpose.

(2) Money available to the States under the provisions of the Smith-Lever extension act of May 8, 1914.

(3) Appropriations by State legislatures, usually to State agricultural colleges, either specifically for this purpose or for general extension work.

(4) Grants by county commissioners, boards of supervisors, and other local authorities.

(5) Money raised by subscription through membership in some association of farmers organized to assist in conducting such work.

(6) Gifts by various private associations or by public-spirited individuals.

The average annual salary of a county agent in the North and West is about \$1,900, and the average total annual budget is about \$3,000. There is a very wide range of salaries in the various States, the minimum being \$1,100 and the maximum \$4,000 per annum. The contribution from Federal and State sources does not usually exceed \$1,200 of the total budget of the agent.

QUALIFICATIONS OF THE COUNTY AGENT.

Qualifications for appointment as a county agent in the Northern and Western States vary somewhat. Graduation from an agricultural college is a usual, though not an absolute, requirement except

in a few States. Of the county agents at work in 1916, 319 are agricultural college graduates. Of the others, all but 16 have had some college training. Farm experience by the appointee is a universal requirement. In most of the States it is required that a part at least of this experience shall have been received since leaving college. No arbitrary age limit has been fixed, though for the most part the agents are men of maturity, the average age of the men now at work at the time of employment being nearly 31 years. Necessary as it is that the county agent should know agricultural science and have had personal experience in practical farming, there are certain other qualifications usually spoken of as "personality" that are of equal, if not greater, importance. He must possess equanimity of temperament, poise, infinite tact and judgment, and, most of all, "common sense."

DUTIES OF THE COUNTY AGENTS.

The county agent is the personal agency through which the State agricultural college and experiment station and the United States Department of Agriculture offer the results of their research and experiments in a personal way to the farmer. He is more than this, because he helps the farmers of the county discover themselves. In every county there are many skilled and successful farmers the lessons of whose success the county agent makes available to all. The agent is not mainly an adviser or an expert, though both names have been applied to him. In the broadest sense he is a teacher. His classroom is the county and his laboratory the farms. His teaching is by object lesson, by demonstration rather than by books. (Fig. 3.) In carrying out the demonstrations, he works with individuals; but the benefit to the individual worked with is incidental; his real purpose is to reach the community through demonstrations and thus teach all. The necessity for continuing the demonstration ceases when its lesson has been accepted and becomes the common practice of the community wherein it is conducted.

The fundamental purpose of county-agent work is to assist in the development of a type of permanent agriculture which will yield to the farmers a reasonable return for capital and labor and stimulate a desire for the best use of these profits in the advancement of all that pertains to more satisfying country life.

EQUIPMENT FOR COUNTY-AGENT WORK.

The county agent spends about three-fourths of his time with the farmers in their fields, barns, and homes. Most of the agents use automobiles for travel about the county. Wherever the conditions of the roads will permit, an automobile greatly increases the efficiency of the agent. The special equipment needed varies somewhat with

the agriculture of the county. The following items have been found generally useful: A stereopticon and slides, particularly slides illustrating local conditions and the demonstration work conducted by the agent. A camera for photographing demonstration work and securing illustrative material for use in newspaper articles, reports, circulars, lantern slides, charts, etc.; by means of the camera and the stereopticon the agent is able to record the results of his demonstration work and present them at winter meetings when it is possible to secure the attendance of people who would not take time during the summer to visit the demonstration fields. A soil auger for sampling soils. A soil-acidity testing apparatus. A magnifying



FIG. 3.—The county agent helps individual farmers. In the figure an agent is showing a farmer how to make a spray mixture.

glass for seed examination. A surveyor's instrument for replanning fields, laying out drainage systems, etc.

Most of the agents maintain an office and have at least one regular office day each week when they can be consulted by anyone interested in the work. The offices are equipped usually with desk, chairs, tables, filing cabinets, reference books, and bulletins. Most of the agents have available the services of a stenographer at least part time. In a few counties the agents have branch offices or centers in different parts of the county, where they spend one or more days each month interviewing farmers, holding meetings, arranging and supervising demonstrations, and visiting farms.

THE COUNTY ORGANIZATION.

Coincident with the establishment of county-agent work in the North and West, there has developed a new type of farmers' organization having for one of its purposes the improvement of agriculture through cooperation with the agent. The form of this association and the method of organizing it differ to some extent in almost every State and in some cases even within the State itself. Recently there has been a decided tendency toward the standardization of these various organizations. They may be grouped somewhat as follows:

(1) Those having a central organization with a representative membership of farmers scattered generally throughout the county and paying an annual membership fee of from \$1 to \$10 each. Associations of this sort usually hold meetings annually and have a board of directors or an executive committee for carrying forward the business of the organization and an advisory council or other group of elected or appointed officials, who meet at stated intervals, usually monthly, to consult with the county agent in regard to the conduct of his work. Many of the organizations of this type are incorporated.

(2) Those having a central organization made up of delegates from township groups or other subordinate units. These local groups usually meet monthly and discuss matters of community interest, the county agent being present whenever possible. The central or delegate organization meets usually on the call of the president whenever there is important business to transact.

(3) Those having a central organization made up of delegates elected from various rural organizations already in the county, such as farmers' clubs, granges, farmers' union, gleaners, the equity, etc. Such an organization is sometimes called a federation. These various associations hold their regular meetings and the federation committee which makes up the central association meets at stated intervals or on the call of the president, and exercises the functions of the advisory council in plan No. 1.

(4) Dissociated farmers' clubs without a central organization through which the agent extends his work.

In a few cases the county board of commissioners or supervisors have constituted the central organization and in a few others an agricultural committee of the chamber of commerce has been a local cooperating body. The fundamental purpose of all these forms of organization is the same—that of bringing together a number of interested people with whom the agent can work directly and who will assist him in planning his work and cooperate with him in his demonstrations. They are public-spirited citizens, the leaders, who give of their time and money for the public weal. The county agent needs such a body of representative farmers back of him, not so much for their financial support as for their moral support. Each of these

types of organization has been successful in particular counties, but those partaking of the characteristics of the first group have been the most uniformly so in the North and West and those of the third group the least so. The chief difficulty with the federation plan is that the rivalries and jealousies often existing between the various local bodies tend to prevent harmonious cooperation. About 50 per cent of the associations originally formed for the purpose of cooperating with the agent have been reorganized along the lines of the first group, which seems to be successful under a great variety of conditions and probably forms the most satisfactory basis for county-agent work



FIG. 4.—The county agent arranges demonstrations on farms throughout the county. In the figure he is holding a field meeting and explaining the results secured. This is an improved farmers' institute on the farm.

thus far evolved in the North and West. The success of the organization of whatever form is dependent on the following factors:

(1) The association should be made up essentially of farmers and managed by farmers. Urban people may be members but should not be officers and should not seek to control its policy or interfere in the execution of its plans.

(2) The association must have a serious purpose, a well-developed plan, and an active part in the execution of the projects undertaken by the county agent. It stands for organized self-help.

(3) The association of whatever type should be organized before the county agent begins work and a committee appointed for the purpose should cooperate with the State county agent leader in the selection of the agent.

METHODS OF WORK.

When a county agent is installed, he consults with the executive committee of the county association or, in the absence of an organization, with a number of the leading farmers as to the more important local agricultural problems. Having satisfied himself by field observation as to the correctness of this diagnosis, he, in cooperation with the State county-agent leader and the specialists at the agricultural college, develops a definite agricultural improvement program for the county and selects certain parts of it as projects for immediate attention. These projects he develops in written form and submits to his executive committee and the State county-agent leader for approval and secures the cooperation of interested members of the county association in carrying them out. Demonstrations illus-



FIG. 5.—The county agent conducts parties of farmers on "excursions" to farms of successful men whose good work make the best "demonstration."

trating the improved methods provided for are carried on in cooperation with a number of the farmers. When the results of the demonstration are apparent, field meetings are held in order that the farmer may see the results and determine their value. (Fig. 4.) It will often be found that the most acute problems of the county have been already solved by several of the good farmers. It is the business of the county agent to find these good farmers and use their farms as demonstrations to the community. (Fig. 5.) The county agent also assists farmers by pointing out the principles of successful cooperation in producing, purchasing, and marketing and by guiding the footsteps of the new cooperative enterprises, but he does not serve as their business agent. He helps them do business for themselves. The agent also assists in conducting short courses, holds meetings, writes timely agricultural articles for the local press, distributes circulars and bulletins, and calls in the specialists from the college,

the experiment station, and the Department of Agriculture when needed.

The demonstrations are both with individuals and with groups of people. Whenever possible, the agent arranges for a meeting of a few neighboring farmers at the demonstration field. These meetings are often small, consisting of only three or four farmers, adjoining landowners, who meet with the county agent at the demonstration field when he calls to observe the progress of the work. These small meetings are the most efficient means of extending the influence of the lesson sought to be taught. Large meetings are only encouraged when the demonstration is fully "ripe." Often, however, while the work may appear to be with the individual farmer, it exerts its influence silently though none the less effectively.

RESULTS OF WORK IN 1915.

LINES OF WORK.

The diversified agriculture in the Northern and Western States necessitates a wide variety in the kinds of work done. An enumeration of a few of these in the following table gives an idea of the comprehensiveness of county-agent work.

Classified list of some lines of work conducted by county agents during 1915.

Lines of work.	Number of agents reporting.	Number of demonstrations.	Number of meetings.	Attendance.	Lines of work.	Number of agents reporting.	Number of demonstrations.	Number of meetings.	Attendance.
FARM CROPS.					ORCHARD AND TRUCK CROPS—continued.				
Corn:					Spraying.....	140	1,000	671	13,514
Culture.....	22	430	19	457	Thinning.....	12	57	60	431
Seed selection.....	107	1,729	402	14,541	CONTROL OF INSECTS AND OTHER PESTS.				
Variety adaptation.....	61	790	120	1,656	Grasshopper.....	11	246	21	472
Oats:					Harvester ant.....	2	146	15	458
Smut control.....	101	2,854	893	18,964	Hessian fly.....	23	697	90	2,213
Variety adaptation.....	22	203	20	633	Prairie dog.....	2	7	7	34
Wheat:					Weed eradication....	24	90	34	692
Smut control.....	14	71	27	667	SOIL FERTILITY AND MANAGEMENT.				
Variety adaptation.....	26	241	16	172	Barnyard manure...	6	43	9	150
Potatoes:					Drainage.....	19	73	18	335
Seed selection.....	27	532	153	1,371	Fertilizing.....	46	352	109	1,822
Spraying.....	15	139	31	1,095	Green manuring.....	60	1,048	77	1,596
Treatment for scab.	16	112	61	779	Irrigation.....	6	56	23	154
Alfalfa:					Liming.....	118	2,194	359	6,785
Culture.....	99	2,425	286	6,368	Raw rock phosphate.	9	322	76	1,986
Inoculation.....	22	1,079	15	275	Tillage methods.....	10	440	7	288
Other farm crops:					Top - dressing meadows.....	39	436	66	1,002
Canada field peas..	11	153	5	216	LIVE STOCK.				
Feterita.....	5	156	6	50	Blackleg treatment..	37	232	94	570
Red clover.....	8	365	6	128	Hog-cholera control..	72	1,538	347	9,311
Soy beans.....	31	277	59	1,499	Feeding.....	56	547	115	2,743
Sudan grass.....	22	615	34	465	Poultry keeping.....	32	345	87	2,961
Sweet clover.....	26	351	41	218	Stock judging.....	37	212	159	17,893
Vetch.....	25	655	34	916					
ORCHARD AND TRUCK CROPS.									
Packing fruit.....	13	46	42	2,624					
Pruning.....	99	1,060	791	14,642					

Among other lines of work may be mentioned testing corn for silage, seed testing, seed improvement, control of alfalfa blight, demonstrating the use of cowpeas, kafir corn, milo maize, demonstrations in rice, sorghum, and sugar beets, control of army worm, chinch bug, cutworm, field mice, rabbits, alkali control in soil, home mixing of fertilizers, subsoiling, summer fallowing, caponizing poultry, control of anthrax, extermination of foot-and-mouth disease, tuberculin test, canning demonstrations, clearing land, deep plowing, hog pasture, restoration of humus, orchard management, pasture improvement, home sanitation, including water supply and sewage disposal and fly control. In all, more than 30,000 demonstrations were conducted which were personally observed at meetings by more than 160,000 persons.

WORK WITH CROPS.

While the average period of service of the county agents on duty March 1, 1916, is less than two years, there are tangible results that can be measured in increased returns to the farmer. The following table gives a few results of county-agent work in relation to crops taken from the annual reports of the agents for 1915:

Some results of the work of the county agents in relation to crops, 1915.

Lines of work.	Agents reporting.	Number.
Corn:		
Farms on which seed corn was selected in the fall.....	234	21,075
Acres planted with selected seed corn.....	173	516,094
Farms testing seed corn for germination.....	174	14,059
Acres of corn planted with tested seed.....	147	352,695
Resultant increased corn yield per acre on demonstration fields where yield was determined.....bushels..	54	12.8
Wheat:		
Farms on which wheat was grown following suggestions of agent.....	133	7,363
Total acres of wheat so grown.....	127	216,960
Resultant increased wheat yield per acre on demonstration fields where yield was determined.....bushels..	53	8.4
Oats:		
Farms treating seed oats for smut.....	147	22,762
Acres sown with treated seed.....	143	708,056
Resultant increased oat yield per acre on demonstration fields where yield was determined.....bushels..	71	8.8
Potatoes:		
Farms on which potatoes were treated for scab following suggestions of agent....	176	3,726
Farms on which the potatoes were grown following suggestions of agent.....	141	3,793
Total acres of potatoes grown.....	127	9,745
Resultant increased potato yield per acre on demonstration fields where yield was determined.....bushels..	65	41.8
Hay:		
Farms on which hay was grown following suggestions of agent.....	107	3,317
Total acres of hay so grown.....	96	22,150
Resultant increased hay yield per acre on demonstration fields where yield was determined.....tons..	51	1.1
Alfalfa:		
Farms on which alfalfa was sown following suggestions of agent.....	270	11,311
Total acres of alfalfa so planted on above farms.....	263	92,518
Farms on which the seed or soil for alfalfa was inoculated.....	246	7,445
Sweet clover:		
Farms on which sweet clover was grown following suggestions of agent.....	172	1,685
Acres of sweet clover so grown.....	170	13,126
Soy beans:		
Farms on which soy beans were grown following suggestions of agent.....	144	1,921
Total acres of soy beans so grown.....	107	17,047

While these results are creditable, they in the most inadequate way measure the value of the work accomplished. The intangible benefits accruing from any form of educational work are often greater than those that can be measured or expressed.

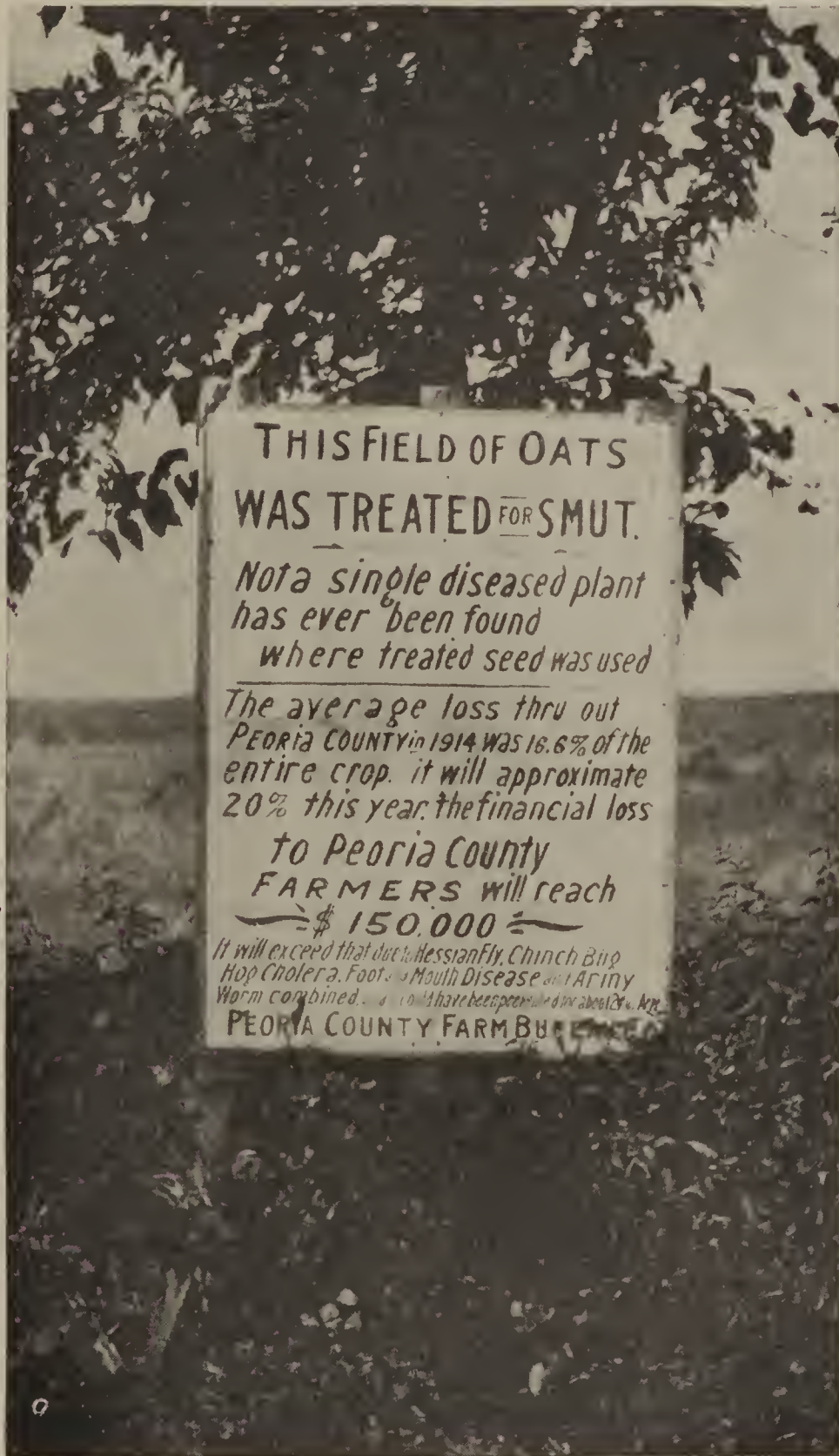


FIG. 6.—Demonstration fields are frequently located along the highway in order to be easily accessible to the public. The sign in the figure shows one method of calling attention to these fields.

The above data relating to the work of the agents with farm crops cover a wide range of demonstration and personal service work. In the far Northwest, in North Dakota, northern Minnesota, and Michigan the work with corn was usually in securing a variety that would mature in the short growing season. Corn production has been en-

couraged in parts of these States where it was not commonly grown previously. In one county in North Dakota where a county agent has been employed for four years the corn acreage has increased from 2,000 to 50,000 acres. This increased acreage is far in excess of that in any county in the State not having an agent. In the corn belt the work has been chiefly in connection with the testing of seed and the standardization of varieties. In New York and New England it has been in promoting the growing of more satisfactory silage varieties.

The work in Illinois illustrates the value of concerted attention in introducing a new crop like alfalfa. The increase of acreage of this crop in counties having agents is much greater than in adjoining counties. In one county alone which has had an agent since 1914 there is now more alfalfa acreage than there was in the entire State at that time.

The work of the agents in relation to the treatment of oats for smut well illustrates the value of the demonstration method of work. (Fig. 6.) The effectiveness of the formaldehyde treatment for oat smut was established years ago. Bulletins describing the method of treatment have been issued by almost every experiment station in the oat-growing States. These have been given wide circulation. The press and the farmers' institute have given line upon line and precept upon precept in regard to the treatment, and yet the county agents found upon taking up their work in some of the largest oat-growing counties in the United States that but very few farmers were treating their seed oats for smut. Most farmers said when approached on the subject that they had no smut in their fields. The smutted oats are much shorter than the plants that are not diseased, and a considerable percentage of smut may exist and not be apparent. To convince the farmers of the presence of smut in their fields and the desirability of treatment, it was often necessary to count the smutted heads in fields thought to be free from smut and make demonstrations in which the seed for a part of the field was treated and for the remainder left untreated and hold meetings at these fields, where the farmers could note the difference in the amount of smut in the two portions of the fields, and to determine the yield on the treated and untreated areas. The average increase in yield per acre due to the treatment on all demonstrations has been 8.8 bushels, which was obtained at a cost of less than 10 cents. In some counties where demonstrations have been carried on for three years the practice of treating seed oats for smut has now become almost universal.

WORK WITH LIVE STOCK.

The extent and diversity of county-agent work in relation to live stock is indicated by the following table:

Work of the county agents in relation to live stock, 1915.

Lines of work.	Agents reporting.	Number.
Registered animals secured for farmers (horses, cattle, sheep, and hogs).....	218	7,698
Registered sires transferred from one community to another.....	103	969
Cow-testing associations organized.....	87	143
Cows tested for milk production through such associations.....	83	62,217
Cows tested for milk production by individuals.....	182	16,603
Live-stock breeding associations organized.....	60	90
Total membership in such live-stock breeding associations.....	58	3,241
Farmers influenced to feed more live stock.....	143	4,735
Farms on which balanced rations figured by county agent are known to have been adopted.....	237	4,375
Animals tested for tuberculosis.....	77	8,113
Animals treated for blackleg.....	104	34,851
Hogs vaccinated for cholera by agent.....	81	88,688
Hogs vaccinated for cholera by veterinarians or farmers on agent's suggestion.....	153	204,304
Antihog-cholera clubs organized (1915).....	39	142
Farms on which the agent assisted in controlling foot-and-mouth disease.....	23	1,952
Silos constructed.....	181	2,930

The work of the agents in relation to live stock has been for the most part along the following lines:

(1) The introduction of live stock in regions where grain farming had been exclusively and largely practiced.

(2) The standardization of breeds has been undertaken in a number of counties. This is a project in which it will take years to show marked results, but a good beginning has been made. Most of the 90 live-stock breeding associations organized by the agents in 1915 were for this purpose. Among the registered animals introduced were 124 stallions, 1,556 bulls, and 2,103 cows. A valuable service has been in connection with the transfer of sires of proved worth from one community to another. The practice of sending the head of the herd to the block after two or three years of service is costly and frequently sacrifices a good animal in his very prime. The agents have been able to save many valuable animals; some at a time when they were in the very act of being loaded on cars for shipment to the market.

(3) Testing animals for production, chiefly through the formation of cow-testing associations. Through these associations and by individuals induced to test their own herds more than 75,000 cows have been tested for milk production during the year.

(4) Work in dealing with animal diseases. In this work the county agent does not supplant the veterinarian, but rather he paves the way for a competent and conscientious practitioner. In very few cases where the agent has treated animals personally would the treatment have been administered had it not been for the county agent. The work of the agent in connection with all animal diseases is to demonstrate the value of approved methods of treatment and to teach the farmers sanitation and quarantine measures and to treat their own animals when practicable and to call a competent veterina-

rian in time. The value of the hogs saved as a result of treatment for cholera is difficult to determine. Most of the 292,992 hogs treated were in sick or exposed herds, and the percentage saved was very high. More valuable than the treatment of these hogs has been the campaign inaugurated through the clubs organized for the purpose of controlling the spread of the disease. Through these clubs sanitary measures have been taken, suspicious cases reported and isolated, dead animals buried, quarantine laws enforced and community effort stimulated, without which the control of contagious animal diseases is not possible. In connection with the foot-and-mouth disease the county agent did good service. In Indiana many of the agents devoted practically their whole time for months to this work. Often the county agent discovered suspicious cases and induced the establishment of local quarantine before the State or Federal authorities could reach the locality.

WORK WITH SOILS.

The county agents recognize that the maintenance of fertility is a universal problem and fundamental to permanent agricultural prosperity and have given it a large place in their program for better agriculture, as the following table shows:

Work done by the county agent in relation to fertility and productivity of soil.

Lines of work.	Agents reporting.	Number.
Farmers reenforcing the manure with acid phosphate or floats.....	107	1,318
Farms using chemical fertilizers on suggestion of the agent.....	159	7,235
Farms on which the chemical fertilizers were home mixed on suggestion of or under the direction of the county agent.....	75	2,121
Local sources of lime or limestone developed.....	65	310
Limestone crushers or grinders introduced.....	36	77
Tons of lime or limestone used.....	169	160,618
Acres of legumes plowed under for green manuring.....	71	66,041
Number of farms on which the agent tested the soil for acidity.....	221	11,748
Crop-rotation systems planned.....	249	5,034
Drainage systems planned.....	211	1,273
Acres in drainage areas so planned.....	199	143,700
Irrigation systems planned.....	46	318
Acres in irrigation areas so planned.....	46	49,487

They have attacked the problem of soil improvement from almost every angle to meet local conditions. The 143,700 acres drained and the 49,487 acres irrigated, following plans made by the agents, may be considered as new productive acres, totaling in all an area equal to about eight congressional townships.

In connection with the use of fertilizers, good results have been obtained in bringing about the adaptation of the fertilizers to the soil and crop requirements. Farmers have been shown how to mix fertilizing materials themselves, and by this means not only greatly reduce the cost, but also to secure the formula they desired and not be compelled to pay for some ingredient they did not need.

Most of the land in the Eastern and Central States has been long in cultivation and is in need of humus. To provide this and correct soil acidity by liming are, according to the testimony of the agents, the two most important soil problems in these States. The use of red clover, soy beans, cowpeas, sweet clover, and vetch as leguminous crops for green-manuring purposes to supply humus-forming material has been greatly stimulated. Lime is often needed in amounts of one or more tons per acre, and the cost of lime, including freight rates, has often been so high as to make its use prohibitive. In some cases the agents have been able to secure a considerable reduction of freight rates. This has been particularly true in New York and other Eastern States. In other instances local sources of lime have been developed by the installation of small community grinders and by the discovery of marl beds. In one instance an agent found a farmer who was paying a high price for lime and hauling it several miles from a railway station. The county agent discovered a marl bed on his farm and a few hours' work uncovered a supply sufficient for the whole neighborhood for years to come.

WORK IN RELATION TO FARM BUSINESS.

In the last analysis the acid test of county-agent work is determined by the answer to the queries: Have the farm profits been increased? Is the farmer getting more satisfactory returns for his investment and labor? Farm profits are dependent not only on increased production, but also quite as often on the conservation of waste, simpler and more direct methods of distribution, or the more economic readjustment of farm enterprises. The nature and the scope of the county agents' activities in relation to farm business are indicated in the following table:

Work done by county agents in relation to farm business in 1915.

Lines of work.	Agents reporting.	Number.
Farm analysis records taken by county agent and farm management demonstrator..	137	11,523
Farms on which the management was modified as a result of farm analysis.....	52	512
Farmers induced by the agent to keep farm accounts, partial or complete.....	204	4,619
Farmers' exchanges organized in 1915.....	70	93
Value of business done through such exchanges organized in 1915.....	51	\$341,110
Farms rented through exchanges.....	33	193
Farms supplied with laborers through exchanges or otherwise.....	120	2,935
Total number of laborers furnished to farmers.....	122	5,488
Other purchasing and marketing associations organized.....	69	164
Total value of all business done in 1915 by all associations organized by agent or on his suggestion.....	113	\$3,575,373
Approximate savings effected by such associations.....	98	\$277,975

As the table shows, 137 of the agents, assisted by the farm-management demonstrator, have assisted 11,523 farmers in analyzing their farm business and in determining the factors limiting income.

In the cooperative purchase of farm supplies and cooperative marketing of farm products the agents in 1915 promoted the organization of 93 farmers' exchanges and 164 other purchasing and marketing associations, which did a combined business of more than \$3,500,000, and effected a saving to the farmers of more than \$275,000.

In Branch County, Mich., the business of four cooperative associations organized by the agent amounted to about \$500,000. This business was principally in connection with the marketing of live stock.

In meeting the farm-labor problem the agents were able to bring the man and the job together in 5,488 cases, helping 2,935 farmers out of tight places.

In carrying forward their work last year the 368 agents reporting to the Office of Extension Work North and West made 194,217 farm visits; 181,112 farmers called at the agents' offices for assistance; they addressed 29,929 meetings, with a total attendance of 1,741,272; nearly 500,000 letters were written to farmers, and more than a million circulars and circular letters were sent out; 1,046 local short courses were held, with an attendance of more than 120,000 farmers and members of their families; 1,503 boys' and girls' clubs were organized, with a membership of 37,123. Only a few features of county-agent work can be measured in acres, tons, or bushels, or its value expressed in dollars. Of far greater value is the intangible benefit in the development of community ideals and community spirit.

HOW TO SECURE A COUNTY AGENT.

County-agent work in the Northern and Western States is conducted by the various State agricultural colleges, in cooperation with the United States Department of Agriculture and the farmers of the county. It is part of the extension organization of the State college and in immediate charge of a State county-agent leader who is the joint employee of the college and the department. The preliminary steps necessary to secure the appointment of an agent should be ascertained through the State extension director. He has headquarters at the State agricultural college.

CONCLUSION.

In conclusion, it may be said that the county-agent work in the Northern and Western States for the last four years is a record of accomplishment. Its influence has been felt in increased crop yields, the introduction of new crops, and help in the control of insect pests and plant diseases. It has introduced improved live stock, inaugurated better feeding and breeding methods, induced better sanitation, and aided in the control and eradication of animal dis-

eases. It has taught the farmer better methods of conserving the fertility of his farm through adequate drainage, proper fertilization, and the utilization of humus-forming materials. Its tendency is toward standardization of farming in crops, live stock, and methods. It has assisted him in marketing his products and the purchasing of his supplies. It has developed better systems of farm management, assisted in securing farm laborers, and assured to the farmer a more adequate return for his investment and labor. It has helped to make life in the country more satisfying through the installation of home conveniences to lighten the burden of the farm women, through interesting the young people in wholesome rural activities, and through the creation of a genuine community spirit of self-help, self-improvement, and self-assertion.

